Palmetto AVIATION

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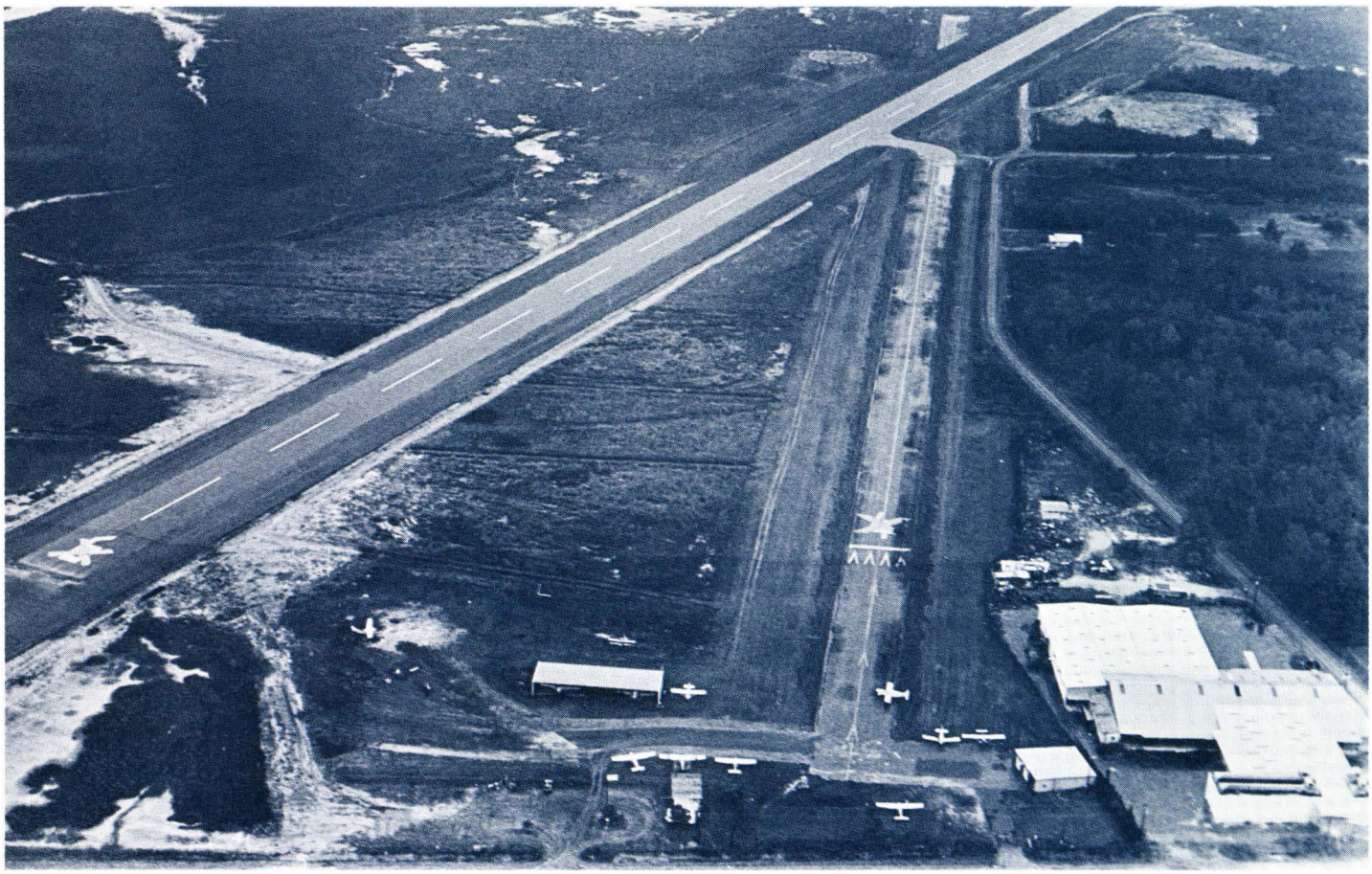

Beaufort re-opens with new, realigned runway

The Beaufort County Airport is open for business again with a brand new 3,430 foot asphalt runway.

The re-opening took place a day later than originally scheduled because the FAA inspector misread his instrument and thought the runway 6 approach slope was below the required 20:1.

A scattering of city, county and aviation officials waited in cold, drizzling rain for the ribbon cutting ceremony but the FAA was adamant. If the approach was below the minimum, the airport could not be opened.

Nobody could understand what happened. The county engineer and consulting engineers had measured the approach and found it to be 20:1 or better. The FAA said it was 13:1.

What had happened was that the FAA inspector had read the percent scale of his hand level instead of the degrees scale — an embarrasing situation.

The next day, the FAA admitted the blunder and concurred in the opening of the airport.

County Administrator Mike O'Neill graciously replied: "We appreciate the diligence of the FAA in inspecting safety factors, its sticking to its guns when questioned, but also its willingness to review its data.

The new runway has been shifted about 20 degrees away from the old alignment to provide for clearer approaches. It no longer butts squarely up against the highway. It is also lighted with medium intensity runway lights which are turned on automatically by a photo sensor.

The old runway has been patched and converted to a taxiway.

Work on the $1.86 million project began April, 1979. The runway was officially opened Dec. 17, 1980.

PALMETTO AVIATION is an official publication of the South Carolina Aeronautics Commission. It is designed to inform members of the aviation community, and others interested in aviation, of local developments in aviation and aviation facilities and to keep readers abreast of national and international trends in aviation.

The Aeronautics Commission is a state agency created in 1935 by the S.C. General Assembly to foster and promote air commerce within the state.

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Law sets stiff penalties for damaging airport property

Malicious and wanton destruction of equipment and facilities at airports is serious business.

People who engage in that kind of sick recreation don't stop to think that their actions could cause someone to be seriously hurt or even killed.

Take the case of a pilot, low on fuel, looking for an airport at night. The only way he can positively identify the runway location and alignment is to spot the runway lights. If these lights aren't working because some thrill seeker busted them all with a hammer, then that pilot may end up in the trees.

State law provides strict penalties for that kind of foolishness. Someone convicted of maliciously damaging or removing facilities or equipment at airports will be fined not less than $1,000 or sentenced from one to five years in prison, or both. When death results from the damage or removal, the person convicted can be sentenced for up to 30 years.

By the same token, people who are convicted of unlawfully entering an airplane or damaging or removing equipment from it can be fined $1,000 to $10,000 or imprisoned from one to 10 years, or both.

The law also provides penalties for trespassing, parking, driving or drag racing on airport property without permission. Any person convicted can be fined $200 to $600 or jailed for two to six months, or both. In addition, the person would have his driver's license revoked for one year.

The laws can be found at sections 55-1-30, 55-1-40 and 55-13-40 of the S.C. Code of Laws.

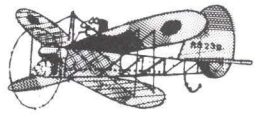
Breakfast Club

The S.C. Breakfast Club will meet at the following locations for breakfast during February:

Feb. 1 **Florence City County Airport**
Feb. 18 **Camden Airport**

Persons planning to attend should arrive at the airports about 9:30 a.m. Breakfast usually begins at 10 a.m. and concludes about 11 a.m.

Persons who would like to host a breakfast club are invited to do so. The only requirements are that the host be responsible for setting up a place for everyone to eat and for transportation to and from the airport. Persons who would like to host the club breakfasts should call Anne or Bill Hawkins at the Camden Airport at 432-3095. The club meets twice monthly, on Sundays.



Letters

I would like to bring to your attention an oversight in an article on page 4 of the November issue of **Palmetto Aviation** by Maj. John A. Morris of Myrtle Beach AFB, specifically the portion addressing Military Training Routes (MTRs). To bring you up to date, the National Ocean Survey commenced depiction of MTRs on Sectional and Terminal Area Aeronautical Charts in April 1980, and is continuing as the charts come up for scheduled revision. MTRs first appeared on the Charlotte Sectional Chart (upon which Myrtle Beach AFB is shown) beginning with the current 28th Edition, dated Sept. 4, 1980.

MTRs are also shown on the IFR and VFR Wall Planning Charts, and the IFR Low Altitude Enroute Charts. The IFR products show current MTR information, as they are published every 56 days. Revisions to MTR data affecting Sectional and Terminal Area Charts, most of which are published twice a year, are highlighted between editions in the Airport/Facility Director, a supplemental publication issued every 56 days by the National Ocean Survey. Incidentally, MTRs are not included in the Airman's Information Manual.

Walter J. Chappas, Associate Director
Office of Aeronautical Charting and Cartography
National Oceanic and Atmospheric Administration

Accidents kill 14 during 1980

number of accidents fairly low, but fatalities higher than normal

The number of accidents in South Carolina during 1980 was the second lowest of any year in the past 10 years, but the number of fatalities, unfortunately, was more than any year since 1974.

There were 30 accidents in the state last year and fourteen people lost their lives in seven of them. Five were killed when two airplanes collided in mid-air over the beach at Hilton Head.

Three others were killed when a Cherokee Six crashed in bad weather shortly after leaving Florence airport March 21, 1980. Severe weather was a factor in another crash near Bennettsville which killed two aboard a Beechcraft Bonanza. The aircraft's left ruddervator was found a mile from the main wreckage.

An engine malfunction caused the crash of a Piper Navajo about 1½ miles short of the runway at Charleston, killing the pilot and injuring five others.

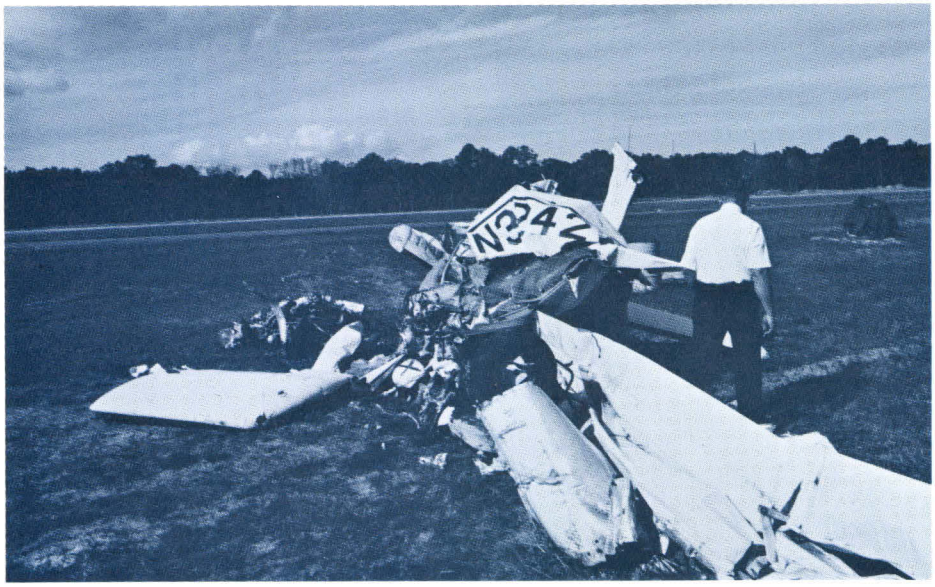
Two cases of poor judgement or lack of skill, or a combination of the two, caused the deaths of a student pilot who apparently stalled and crashed in a bean field near Oswego and a private pilot who apparently stalled on takeoff at Lake City Airport. The student had 18 hours total time. The private pilot had over 1,100 hours, but only six in the last 90 days.

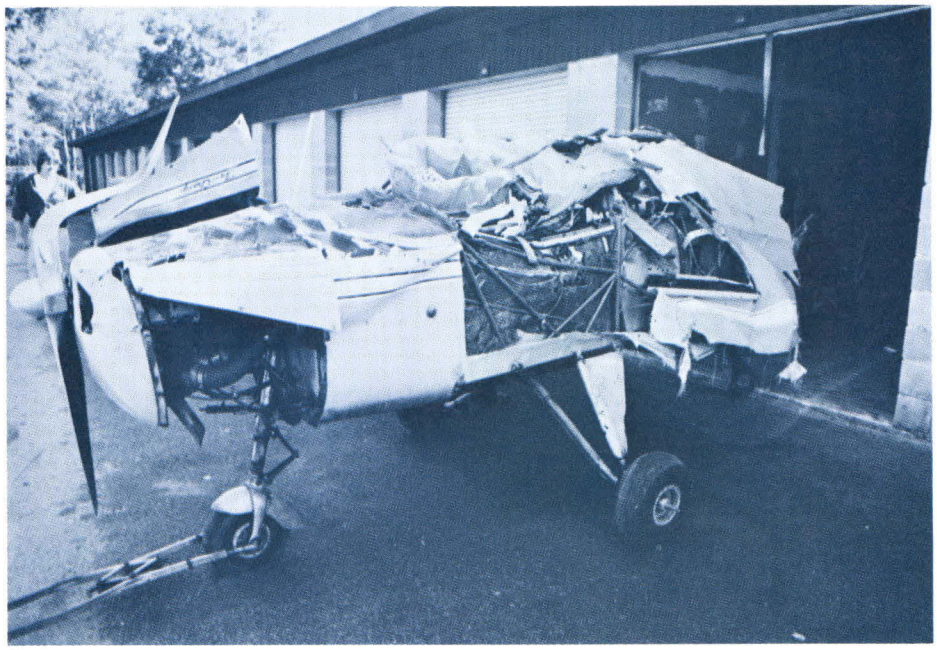
And a case of what has to be sheer stupidity was the causal factor in a crash that killed a private pilot in Anderson. He was flying low over his girlfriend's house and crashed after aerobatics at low altitude.

Of the 30 accidents, more than half — 16 — occurred in the landing phase; six happened during takeoff and eight in the enroute portion of the flight. There were 24 single engine aircraft involved, three multiengine types and three helicopters.

Fourteen of the accidents happened on personal pleasure flights, seven were training flights, three were business trips, four were agricultural operations and two were apparently engaged in illegal activity.

Only three or four of the accidents can be directly attributable to mechanical malfunction. The majority were caused by pilot error, pilot skill deficiency, or poor judgement. Even in cases where weather is a factor, poor judgement is sometimes the causal factor. If pilots had the judgement not to get themselves into situations they and their airplanes can't handle, the accidents wouldn't have occurred.





Five people were killed in the mid-air collision of this Piper Cherokee Six and Aeronca Trichamp over the beach at Hilton Head Nov. 30, 1980. The Aeronca, flown by 28-year-old real estate salesman David Girimont, ran into the front of the Cherokee, according to witnesses on the ground. Thomas B. Reynolds, 39, of Painesville, Ohio, was the pilot of the Cherokee which was carrying Reynolds' wife Kay, 40, his son Howard, 14 and neice Kathy, 16. Both aircraft had departed the Hilton Head Airport only a few minutes earlier. (S.C. Aeronautics Commission Photo)

Icing: a review for winter flying

This is the time of year when bears hibernate and other animals venture out as little as possible. This is understandable since much of winter's weather is not the kind of stuff to play around in.

Sub freezing temperatures bring with them a particularly nasty danger for the pilot — Icing. With those frigid polar air masses edging down on us and beginning to mix with moist air from the gulf, it is a good time to review our knowledge of icing conditions and how to deal with them.

Let's look briefly at induction system icing. This kind of icing can occur at any time, and the outside air temperature (OAT) can be as high as 21 degrees C. or 70 degrees F.

Induction icing has two major causes: marked cooling due to vaporization of fuel, and a decrease in pressure in the venturi tube. It may form in the venturi, on a butterfly throttle valve, at the discharge nozzle, in the curve of the induction system, or in air scoops.

A drop in RPM, or a loss of manifold pressure may be one of the first signs of induction icing. Early application of carburetor heat will usually eliminate the problem.

Airframe icing is likely to occur in temperatures of 0 to -10 degrees C. That's about 14 to 32 degrees F.

Rime ice is described as rough, milky, and opaque. It is formed by small, super-cooled droplets of water which freeze immediately upon striking the surface of the aircraft. Rime ice builds slowly, and the rough surface it creates causes increased drag.

Rime ice is associated with stable weather and stratiform clouds.

Clear ice, sometimes called glaze ice, is glossy, clear, and translucent. It is generally associated with cumulus cloud-building. Large, relatively warmer drops of water run back and freeze aft of the point on the leading edge at which they strike. Clear ice formation is a slower process than that of rime ice. The build-up takes a horned cross-section shape, and will have a significant effect on lift.

Freezing drizzle will produce a combination of rime and clear ice, known as mixed ice.

Frost can form on the ground or in the air. On the ground, frost often forms during the night, when surface temperatures are low. In clear night air, sublimation occurs — when moist air comes in contact with a very cold surface, like a wing.

In flight, frost may form as the aircraft descends into a relatively warmer, but still freezing airmass, or flies from a very cold airmass to a relatively warmer one.

Frost causes increased drag, which is especially important to consider at slower airspeeds.

Frost on a windshield will also restrict visibility.

Obviously, frost should be carefully removed before takeoff.

Hail is generally associated with highly turbulent thunderstorms. It doesn't lead to structural icing, but impact could cause physical damage.

Sleet causes ice formation when mixed with freezing rain. There are usually areas of freezing rain above sleet areas, and associated with them, so that climbing will not enable the aircraft to avoid the icing conditions.

Dry snow does not generally lead to icing, but wet snow may.

The first way to avoid icing conditions is by doing some GOOD preflight planning. Icing depends upon the liquid water content of clouds, so a weather briefing should include the types of clouds you are likely to encounter.

Study weather maps carefully. Look for the position of fronts. The cloud system of a warm front will probably be stratiform and may imply rime ice. A cold front, with prefront squall lines and airmass thunderstorms may indicate the possibility of the clear ice associated with turbulence and large water droplets.

Remember that icing is variable. Movement of an airmass for many reasons does not allow for very accurate forecasting of specific icing conditions.

PIREPS are often a good source of

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NTSB warns pilots: take icing seriously

The National Transportation Safety Board recently warned pilots not to become complacent about the threat from airframe and engine icing because of the speed and sophistication of modern aircraft.

"While the advances in the design of engines and deicing and anti-icing equipment have markedly reduced the hazards of ice in general aviation flying, they have by no means been eliminated," the Board said in releasing Issue No. 12 of its 1979 "briefs" of general aviation aircraft accidents.

As an example of the threat from icing conditions, the Board cited the crash of a Cessna Turbo Centurion near Dunsmuir, California, which killed 6 persons. The pilot, who had a total of 650 hours flying time, was advised prior to takeoff of thunderstorms, icing and turbulence along portions of her planned route to Redding, California.

Despite the marginal weather, she elected to make the flight over the mountainous terrain. After departing under Visual Flight Rules (VFR) from MacDoel, California, the pilot received an Instrument Flight Rule (IFR) clearance to Redding at 11,000 feet. Thirty minutes later the pilot reported icing conditions and requested to climb to 13,000 feet. But within four minutes, the pilot made her last transmission, again saying "we're having problems with ice."

The Board's investigation showed the pilot had few options once she entered the area of icing. She was over mountainous terrain and couldn't descend too low. An attempt was made to climb, but apparently ice degraded the aircraft's climb capability. But the pilot's first mistake and the basic cause of the accident was her decision to continue the flight into the adverse weather which included icing conditions.

In a word of caution prompted by the continual appearance of icing as a "probable cause" of accidents, the Board said "Icing conditions, once anticipated, must be avoided or countered by prompt use of anti-icing or deicing equipment. The equipment's limitations must be known and never exceeded. When there is doubt, an alternate flight path always is best. But above all: Never take icing control for granted."

Copies of the National Transportation Safety Board's "Aircraft Accident Reports, Brief Format, U.S. Civil Aviation, Issue No. 12 of 1979 Accidents" may be purchased from the National Technical Information Service, U.S. Department of Commerce, Springfield, Virginia 22161.

'Safe Pilot' continued for 1981

Grand Prize is airplane worth $50,000

If you missed out on a chance to win that $50,000 airplane last year, try again this year.

The General Aviation Manufacturers Association (GAMA) has announced that they will continue the popular "Safe Pilot" sweepstakes in 1981.

Every pilot and student pilot attending an FAA Safety Seminar will be eligible to win a $50,000 general aviation aircraft and one of 22 $100 pilot proficiency scholarships, awarded monthly, two per region. The scholarships can be used for dual instruction at the flight school of the winners choice.

Drawing for the airplane from all the entries received during the year will be held in January, 1982. Entrants, 16 years old on or before Dec. 31, 1981, may submit a new entry at each safety seminar attended during the year.

The Safe Pilot '81 program is a cooperative government/industry effort in support of the activities of the FAA's accident prevention program.

* * *

Johan Cappelen, a student at the North American Institute of Aviation in Conway, won a $100 flight proficiency scholarship in the October Safe Pilot '80 drawing.

Solo scholarship recipients

These cadets plus two others, not shown, received scholarships to pay for flight training through their solo flights during 1980. Standing are Lt. Col. Britt White, of Columbia; 2nd Lt. Robert Hughes of Charleston; WO Todd Wyndham of Charleston. Kneeling, 1st Lt. Carlos Ortiz and 2nd Lt. Lawrence West of Charleston and Lt. Col. Steve Blackburn of Berkeley County. Not pictured are Lt. Vance Fleming, Aiken and Capt. Anthony Atkins of Sumter.

Cadets for the program are selected from throughout the Wing by a selection board from applicants who have completed preliminary requirements and who, during interviews, express a desire to continue in aviation and aerospace related studies.

NTSB: FAA should beef up crash safety

Federal regulatory action to vastly improve general aviation aircraft crashworthiness — now inferior to that of the U.S. automobile — was recommended recently by the National Transportation Safety Board.

The Safety Board called on the Federal Aviation Administration to require shoulder harnesses by December 31, 1985, in all general aviation aircraft built to accommodate them, and to impose an interim requirement that the harnesses be installed before registration of any such aircraft is transferred.

The Board said that despite voluminous studies and research projects showing advances in crashworthiness technology, many reported by FAA itself, FAA "is not taking aggressive action to improve the crashworthiness of general aviation aircraft."

"Required design standards for seats and occupant restraint systems in general aviation aircraft are far below those for the family automobile," largely because of regulatory action by Federal agencies toward safer cars, the Board said.

The Safety Board incorporated its latest crashworthiness recommendations in a safety report, "The Status of General Aviation Aircraft Crashworthiness," on which it completed action today. The report reviews crashworthiness technological advances, and the histories of Federal crashworthiness regulation and Civil Aeronautics Board and Safety Board recommendations for improvements.

Design advances for safer aircraft interiors, improved seats and anchorages, and effective restraint equipment "are currently available to make most general aviation aircraft crashes survivable," the Safety Board said in its report today.

The Board noted that FAA's technical standards for safety belts and seats reflect industry standards which were last revised in 1950 and 1956. Further, FAA's 1977 regulatory requirement for general aviation aircraft shoulder harnesses applies only to newly manufactured aircraft, and covers front seats only.

The Safety Board said statistical measurements of the importance of improved general aviation crashworthiness underscore the Board's current concern. More passengers travel in general aviation than in airliners each year, according to estimates, and general aviation flying is rapidly increasing.

During the past decade, more than 100,000 general aviation aircraft occupants were involved in 39,458 accidents — 17.7 per cent of which were fatal accidents. And, based on 20-year aircraft life expectancy, it has been predicted that at least six of 10 general aviation aircraft now in production eventually will be involved in an accident.

In addition to its recommendation for shoulder harnesses in aircraft built to accommodate them, the Board recommended the FAA . . .

— Work with airframe manufacturers to develop and provide owners by December 31, 1982, with detailed shoulder harness installation instructions for existing aircraft which were not built to accommodate them.

— Require that shoulder harnesses be installed in these aircraft by December 31, 1985, and, once instructions are available, in all such planes before their registration may be transferred.

— At established intervals, extend the application of all newly established crashworthiness regulations to newly-manufactured general aviation aircraft.

— Establish criteria by which manufacturers' current "delethalization" of cabin interiors, under an existing regulatory alternative to shoulder harnesses for rear seats, can be measured to determine effectiveness.

— Revise its seat belt, shoulder harness and seat requirements to achieve the crashworthiness improvements which the agency's own research has shown are needed.

— Establish dynamic test standards for occupant protection features of general aviation aircraft.

The Safety Board also reiterated two previous general aviation crashworthiness recommendations. Their goals are raising of "minor crash landing criteria" to "a level comparable to those produced by a moderate-to-severe crash landing," and a requirement for shoulder harnesses for all seats in all newly-certificated aircraft.

The Safety Board's complete printed report will be available in approximately three weeks. Single copies may be obtained without charge by writing to the Publications Branch, National Transportation Safety Board, Washington, D.C. 20594. Multiple copies may be purchased by mail from the National Technical Information Service, U.S. Department of Commerce, Springfield, Virginia 22161.

Mid-air collision: a serious threat

BY: CAPT. LARRY WILDER
363 TRW Flight Safety
Shaw AFB, South Carolina

You are flying along at 1000 feet AGL viewing the sights in your Cessna 172 when out of the corner of your eye you see something flash by. You push over the flight controls and just miss what you think is a military aircraft. The heart pounding lasts just a few minutes even though the near miss took only seconds. Maybe you saw the other guy in time to take some type of evasive action, however, it is more likely that you didn't.

Mid-air collisions are a real and serious threat to both civilian and military pilots in the Southeastern U.S. With the large number of military air bases and numerous low level operating areas, MOAs and warning areas, one can surely see the potential for disaster exists. In 1979 alone, Air Force crews reported over 300 near mid-air collisions (less than 500 feet separation). Most incidents occurred between military and general aviation aircraft in all phases of flight and while operating under both IFR and VFR flight rules. Nearly all incidents occurred below 3000 feet AGL. The important point here is that this data only accounts for reported Air Force incidents. Take into account other military services, commercial and private aviation and the numbers increase even higher. The primary cause factor in these near misses was the failure to see and avoid.

Many factors contribute to the See and Avoid problem: visibility problems, your own physical limitations, search pattern techniques, aircraft speed and weather factors are just a few. To make the See and Avoid technique successful, we as crew members must be aware of the operating locations of the other guy. This will at least give us a common point of departure.

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Construction begun on CAP wing HQ

Construction work has begun on a 5,000 square foot headquarters building for the S.C. Wing, Civil Air Patrol at Columbia Metropolitan Airport.

The contract was awarded to M.B. Kahn Construction Co., the low bidder at $266,926. The building will be located on 3.8 acres of airport property next to the Midlands TEC Airport campus.

The 5,300 square foot building will contain administrative offices for the wing staff, a multi-purpose auditorium/operations area with seating for 125 persons and a communications center. The com center will have the capability to communicate with other agencies under the state's Search and Rescue and Disaster plans.

Building plans were developed by Design Collaborative, Inc. of Columbia. Expected completion date is June 1.

Scanning technique

An effective cockpit scanning technique is that which is accomplished with a series of short, regularly-spaced eye movements that bring successive areas of the sky into the central visual field.

Each movement should not exceed 10 degrees and each area should be observed for at least one second to enable detection.

Although horizontal back and forth eye movements seem preferred by most pilots, each pilot should develop a scanning pattern that is most comfortable and then adhere to it to assure optimum scanning.

— From FAA Advisory Circular 90-48B, Pilot's Role in Collision Avoidance

Cessna 150 Club formed

The formation of a National Cessna 150-152 Club was announced this week in Durham, North Carolina.

The club has been formed to bring together those who own, or are interested in the Cessna 150-152 aircraft. According to Skip Carden, executive director, the organization will feature monthly newsletters, money saving discount offers, safety and maintenance tips, repair articles, and product evaluation.

Regular Fly-Ins are being planned, says Carden, who has over 11 years of experience directing aircraft clubs.

Anyone interested should write to: The Cessna 150-152 Club, P.O. Box 15388, Durham, North Carolina, 27704.

Study looks to improved air service

The South Carolina Aeronautics Commission will name a citizens advisory committee to work with an aviation consulting firm on a commuter airline study for South Carolina.

The Commission gave the go-ahead for the study last month in an effort to improve air service in the state. Chief planner Jim Goff said the citizens committee will give the consultants valuable input concerning specific local service needs. The Committee will be composed of one person from each congressional district plus various government and industry representatives.

The Commission has been concerned about declining scheduled air service since the airline deregulation act of 1978. With the passage of that act, commercial carriers had greater latitude to fly where and when they pleased and many of the less profitable, short haul routes were dropped. Consequently, much of today's scheduled service in South Carolina suffers because of the limited markets served, the timing of the flights or frequency of service.

The study will be done by Cress and Associates of Lexington, Ky. Cress said it intends to analyze the state's existing transportation system and then identify those areas where commuters could profitably operate and those areas where government subsidies would be required to support carriers.

At the present time, only five communities (Columbia, Charleston, Greenville-Spartanburg, Florence and Myrtle Beach) are served by a certificated airline; but other cities such as Aiken, Orangeburg, Rock Hill, Sumter and Union, even though they have no scheduled service at present, all have population bases large enough to be considered for potential service.

The study will estimate market demand and identify air service opportunities in those communities, then the consultants will meet with prospective airlines to review the potential markets and guage interest.

The study is expected to take six months and cost about $74,000. That amount will include a research and compilation effort by the Aeronautics Commission planning staff totaling about $34,000.

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Icing

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information as to possible icing conditions and the type of ice you may find.

Check the temperature-dewpoint spread. If the temperature is right for icing, (between 0 and -15 degrees C.), and the spread is 2 degrees C. or less, the area may contain icing conditions.

A good source of water, for ice formation can be water that is lying around on the ground from the passage of an earlier storm system.

Clouds that originate over bodies of water are usually wet and contain large drops of water.

Cumulus clouds, with warmer temperatures (-12 degrees C. or more) at their bases, will be very wet in their building stages. The warmer the cloud, the worse the icing possibilities. The colder the cloud, the faster its water content will turn to ice crystals, or snow. Sharp, well-defined cumulus clouds will contain liquid water, while those with fuzzy outlines are probably already in the ice crystal stage.

If you are already in the clouds, watch carefully for ice formation. Ice will form on small objects first, such as an OAT probe or a thin atenna mast. Use the seat of your pants to tell what kind of cloud you're in. Cumulus clouds will give you bumps and updrafts. Stratus clouds are more stable and will give you a smoother ride.

When you encounter ice, you have some choices. You can get to an area where the temperature is warm enough to melt the ice, or get out of the liquid clouds. This may, or may not be lower. Don't rely on the 2 degree per thousand standard. Make sure it really is warmer down there before you give up that valuable altitude. If you must go through the clouds, try to penetrate by the shortest route horizontally and/vertically, or both.

Ice can have varying effects on the aircraft. Handling characteristics can be affected by ice accumulation on control surfaces. Windshields can become opaque. Fuel vents which are exposed to the airstream can become plugged. Generators and avionics may overheat and fail due to blockage of cooling vents. Antennas can break off. Static systems not protected by location or by heating can be affected.

All ice reduces the critical angle of attack — the angle of attack at which an airfoil will stall. With even a small amount of ice, it is wise to increase approach speeds by about 20 per cent because of the probable increase in stalling speed.

Try flap settings in the air before you are close to the ground. If possible, try a practice landing flare at altitude. The landing flare should be very gentle with no abrupt reduction in power. This is the time to "fly it on." Remember that short field performance won't be possible, so check the length and condition of the runway BEFORE you get there.

There are various devices for the removal of structural icing, and for preventing its formation. If you have them, be sure you know how to use them properly, and be aware that, like all mechanical devices, they too can fail.

The best way to deal with icing is still — don't get it!

The State of South Carolina provides this publication free of charge in the interest of aviation safety and aeronautical progress.

Mid-air collision

Continued from Page 6

We at Shaw Air Force Base fly the McDonnell Douglas RF-4C Phantom. Our primary mission is low altitude high speed photographic reconnaissance. Generally, we fly high altitudes out and back from the VR and IR training routes which traverse our local flying area. The Shaw AFB local flying area extends over North and South Carolina, portions of Georgia, Virginia, Tennessee and Kentucky. Once established in the training routes, we maintain altitudes which vary from 100-500 feet AGL to 1500 feet AGL at air speeds of 360-540 knots. With numerous training routes in this area, it is important for the civilian pilot to be aware of our operating altitudes and speeds. It is also extremely important for us to be aware of low altitude airways and caution areas which cross, lie within, or border our training areas. For further information on military training route locations, contact your nearest Flight Service Station, enroute low altitude charts or your airport manager/fix based operator.

Mid-air collisions do happen. If you don't see the other guy, it's difficult to avoid him. Knowing what we do and where we fly may help you to increase your lookout and successfully avoid a near mid-air collision.

Aviation Calendar

JAN. 23-25

AOPA Weekend Ground School Courses, Sheraton Inn, 555 South McDowell St., Charlotte, N.C.

FEB. 25-MAR. 1

Lawyer-pilots Bar Association meeting, Caesar's Palace, Las Vegas, Nev. Contact: David Prewitt 215/546-5636.